ZooKeys 753: 83–106 (2018)
doi: 10.3897/zookeys.753.21094
http://zookeys.pensoft.net

CHECKLIST

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Amphibians and reptiles of the state of San Luis Potosí, Mexico, with comparisons with adjoining states

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Academic editor: *J. Penner* | Received 19 September 2017 | Accepted 28 March 2018 | Published 26 April 2018

http://zoobank.org/D35C921E-A321-478C-A945-9A9F01E8A337

Citation: Lemos-Espinal JA, Smith GR, Woolrich-Piña GA (2018) Amphibians and reptiles of the state of San Luis Potosí, Mexico, with comparisons with adjoining states. ZooKeys 753: 83–106. https://doi.org/10.3897/zookeys.753.21094

Abstract

A summary of the species of amphibians and reptiles of the state has been compiled, including their geographic distributions, habitats, and conservation statuses. The herpetofauna of San Luis Potosí consists of 41 species of amphibians and 141 species of reptiles. San Luis Potosí shares the highest number of species with Hidalgo and Tamaulipas, and the least number of species with Nuevo León. In San Luis Potosí, there are several taxa of particular conservation concern including salamanders, emydid and trionychid turtles, anguid and xenosaurid lizards, and natricid and colubrid snakes.

Keywords

Checklist, Chihuahuan Desert, conservation status, herpetofauna, shared species, Sierra Madre Oriental

Introduction

San Luis Potosí is a relatively small state (surface area = 63,068 km^2, 3.1% of the surface area of Mexico) located in the north-central part of Mexico, between 24°29' and 21°10'N and 98°20' and 102°18'W (see Figure 1; INEGI 2009). The climate of San Luis Potosí varies from the temperate, dry high plains to the warm, relatively humid coast (Lemos-Espinal and Dixon 2013). Several distinctive habitats are found within the boundaries of the state, including the Chihuahuan Desert in the western half and tropical perennial

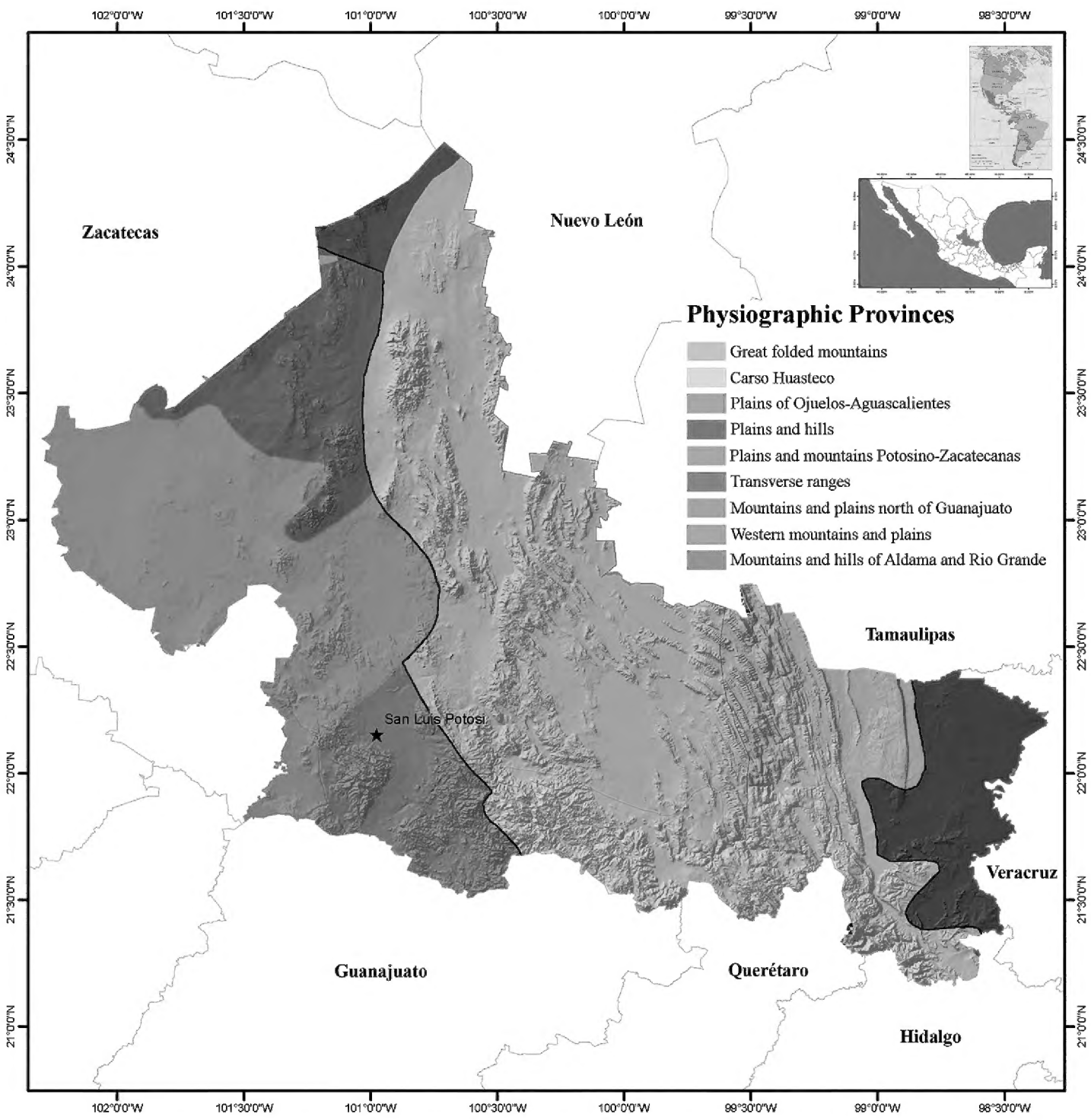

Figure 1. Topographical map with physiographic provinces of the state of San Luis Potosí, Mexico. The thicker black lines delineate the major habitat types found in San Luis Potosí (from west to east): Central Plateau, Sierra Madre Oriental, and North Gulf Coastal Plains (INEGI 2009). Maps modified from Cervantes-Zamora et al. (1990); http://www.gifex.com/fullsize/2009-09-17-3/Mapa-de-Amrica.html; García E – Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (2008).

forests in the southeastern portion (= Huasteca Potosina). Three physiographic provinces that vary in their temperature and the moisture retention of their soils (INEGI 2009; Lemos-Espinal and Dixon 2013) are found in San Luis Potosí: the Sierra Madre Oriental, the North Gulf Coastal Plains, and the Central Plateau (Figure 1). The Tropic of Cancer crosses the northern part of the state, and to the east San Luis Potosí nearly reaches the Gulf of Mexico to the east. The elevation of San Luis Potosí varies from about 50 m above sea level to about 3,180 m in Cerro Grande (INEGI 2009). The variation in climate (Figure 2) and physiography of the state have created a mosaic of habitat and vegetation types in San Luis Potosí (Figure 3) that most likely affect the distribution and

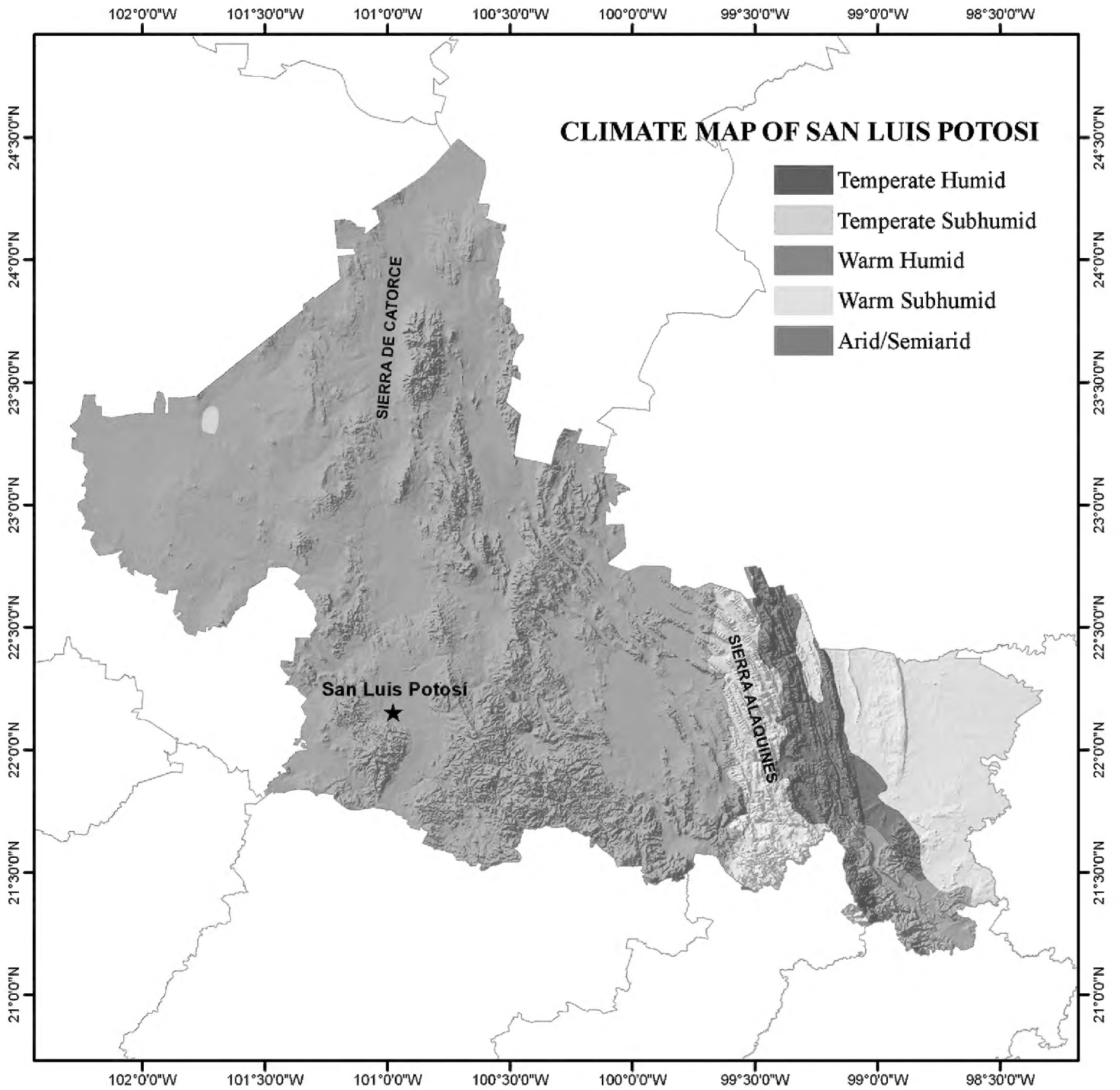

Figure 2. Climate map of the state of San Luis Potosí, Mexico (modified from García – CONABIO 1998).

presence of amphibians and reptiles in the state (see Lemos-Espinal and Dixon 2013 for detailed description of these habitats and vegetation types).

Our understanding of the herpetofauna of San Luis Potosí still remains somewhat limited (see Lemos-Espinal and Dixon 2013 for a review of previous herpetological studies in San Luis Potosí). Our intent with this paper is to encourage others to continue studying the herpetofauna of the state by providing a summary of the species of amphibians and reptiles of the state, their geographic distributions, habitat, and conservation status. By placing all this information into one, easily accessible place, we hope to provide a starting place for further research on the herpetofauna of San Luis Potosí. In addition, a comparison of the amphibian and reptile species lists to those in the neighboring states is provided in an effort to identify unique aspects of the herpetofauna of San Luis Potosí, as well as shared species, with the aim to understand the potential conservation or management needs at the state or regional level.

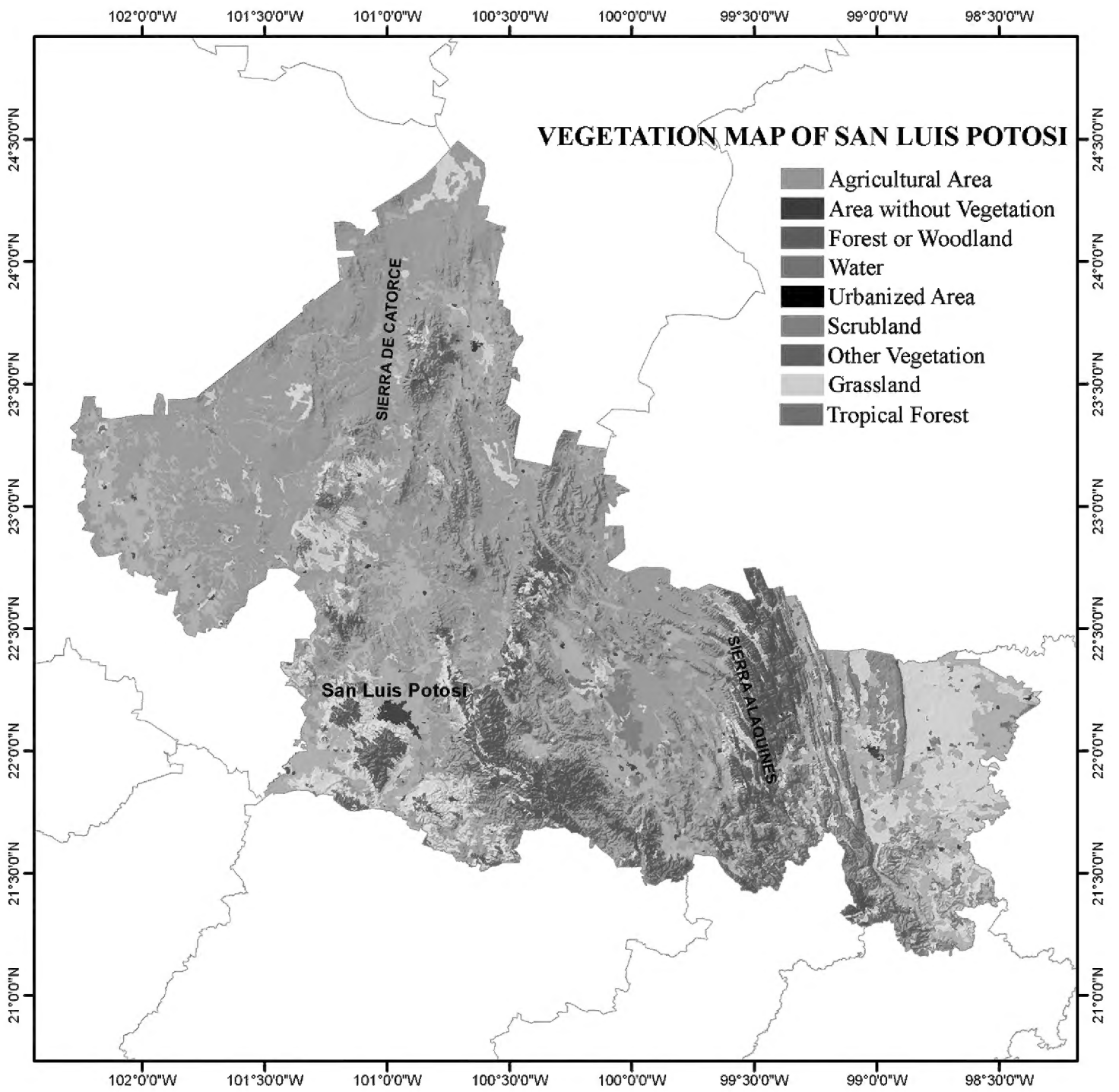

Figure 3. Vegetation type map of the state of San Luis Potosí, Mexico (modified from Dirección General de Geografía – INEGI 2005).

Materials and methods

This list of amphibians and reptiles of the state of San Luis Potosí was compiled from the following sources: (1) our own field work; (2) specimens from the Laboratorio de Ecología – UBIPRO (**LEUBIPRO**) collections; (3) a thorough examination of the available literature on amphibians and reptiles of the state; and (4) databases from the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (National Commission for the Understanding and Use of Biodiversity; **CONABIO**), including records from the following 30 collections:

AMNH	Collection of Herpetology, Herpetology Department, American Museum of Natural History
ANSP	Collection of Herpetology, Herpetology Department, Academy of Natural Sciences of Philadelphia

BMNH	Collection of Herpetology, Zoology Department, The Natural History Museum, British Museum (Natural History)
CAS	Collection of Herpetology, Herpetology Department, California Academy of Sciences
CMNH	Collection of Herpetology, Amphibians and Reptiles Section, Carnegie Museum of Natural History – Pittsburgh
CNAR	Colección Nacional de Anfibios y Reptiles, Instituto de Biología UNAM
EALC	Ernest A. Liner Collection of Herpetology
ENCB	Colección Herpetológica, Departamento de Zoología, Escuela Nacional de Ciencias Biológicas
ENEPI	Colección Herpetológica, Departamento de Biología Experimental, Escuela Nacional de Estudios Profesionales, Unidad Iztacala, UNAM
FMNH	Division of Amphibians and Reptiles, Field Museum of Natural History
FSM-UF	Collection of Herpetology, Florida State Museum, University of Florida
FWMSH	Fort Worth Museum of Sciences and History
LACM	Collection of Herpetology, Herpetology Section, Natural History Museum of Los Angeles County
LSUMZ	Collection of Herpetology, Museum of Zoology, Biological Sciences Division, Louisiana State University
MCZ	Collection of Herpetology, Museum of Comparative Zoology, Harvard University Cambridge
MNHUK	Museum of Natural History, Division of Herpetology, University of Kansas
MZFC-UNAM	Colección Herpetológica, Museo de Zoología "Alfonso L. Herrera", Facultad de Ciencias UNAM
MVZ	Collection of Herpetology, Museum of Vertebrate Zoology, Division of Biological Sciences, University of California Berkeley
SDNHM	Collection of Herpetology, Herpetology Department, San Diego Natural History Museum
TCWC	Collection of Herpetology, Texas Cooperative Wildlife Collection, Texas A&M University
TNHC	Collection of Herpetology, Texas Natural History Collection, University of Texas Austin
TU	Collection of Herpetology, Biology Department, Tulane University, New Orleans
UAZ	Amphibians and Reptiles Collection, University of Arizona
UCM	Collection of Herpetology, University of Colorado Museum
UIMNH	Collection of Herpetology, University of Illinois Museum of Natural History
UIUC	Collection of Herpetology, Museum of Natural History, University of Illinois at Urbana-Champaign
UMMZ	Collection of Herpetology, Museum of Zoology, University of Michigan Ann Arbor

USNM	Collection of Herpetology, Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution
UTAMM	Merriam Museum, University of Texas Arlington
UTEP	Collection of Herpetology, Laboratory of Environmental Biology, Biological Sciences Department, University of Texas - El Paso

Amphibian names follow Frost (2017) and AmphibiaWeb (2017) (http://amphibiaweb.org) and reptile names follow Uetz and Hošek (2017). Species were included in the list if they had confirmed records, either by direct observation or through documented museum records or vouchers. Species accumulation curves were created for the total herpetofauna, amphibians, and reptiles using the year of the first recorded observation for each species. Such species accumulation curves are likely to serve as good estimators of the potential species richness of amphibians and reptiles (see Raxworthy et al. 2012). In addition, the conservation status of each species was recorded based on three sources: 1) the IUCN Red List 2017; 2) Environmental Vulnerability Scores from Wilson et al. (2013a,b) and Johnson et al. (2015); 3) listing in SEMARNAT (2010).

The number of overlapping species with those neighboring states for which a recent checklist exists (Hidalgo: Lemos-Espinal and Smith 2015, Lemos-Espinal and Dixon 2016; Nuevo León: Lemos-Espinal et al. 2016; Tamaulipas: Farr 2015, Terán-Juárez et al. 2016; Querétaro: Dixon and Lemos-Espinal 2010) was determined, and hierarchical clustering analyses with single linkage and Euclidean distances using Systat 13 software (SYSTAT software, Chicago, IL) used to examine the similarities among the herpetofaunas of San Luis Potosí and its neighboring states (see Enderson et al. 2009 for a similar analysis). Lists were updated for Hidalgo (substituting *Lampropeltis polyzona* for *L. triangulum*, Ruane et al. 2014, Uetz and Hošek 2017); Nuevo León (adding *Chiropterotriton miquihuanus*, Campbell et al. 2014; *Crotalus morulus,* Bryson et al. 2014, Uetz and Hošek 2017; and substituting *Lampropeltis annulata* for *L. triangulum*, Ruane et al. 2014, Uetz and Hošek 2017); Querétaro (substituting substituting *L. annulata* for *L. triangulum*, Ruane et al. 2014, Uetz and Hošek 2017; adding *Amastridium sapperi*, Calzada-Arciniega 2014). The neighboring states of Guanajuato, Veracruz, and Zacatecas do not have recent, comprehensive checklists of amphibians and reptiles available so were not included in comparisons.

Results and discussion

San Luis Potosí is home to 182 species of amphibians and reptiles which represent 33 families and 98 genera (Table 1). These include 41 species of amphibians (six salamanders, 35 anurans) and 141 of reptiles (one crocodilian, seven turtles, 48 lizards, 85 snakes). The herpetofaunal account for the state published by Lemos-Espinal and Dixon (2013) listed a total of 181 species of amphibians and reptiles, including Dennis' Chirping Frog (*Eleutherodactylus dennisi*), a species not included in this paper since the only record for this species (ENCB-14250 – *E. dennisi*; collected on August 13th, 1989. 1 km N of Apetz-

Table 1. Checklist of amphibians and reptiles of San Luis Potosí providing Global Distribution (0 = Introduced; 1 = Endemic to Mexico; 2 = Distributed in the United States and Mexico; 3 = Distributed from Mexico and south of Mexico; 4 = Distributed from the United States to Central or even South America; 5 = Distributed from Canada to Mexico or south of Mexico), the habitat type (CD = Chihuahuan Desert, SMO = Temperate Forests of the Sierra Madre Oriental, SBT = Subtropics of the Sierra Madre Oriental; GEN = Generalist – occupies more than one habitat type), IUCN Status (DD = Data Deficient; LC = Least Concern, VU = Vulnerable, NT = Near Threatened; EN = Endangered; CE = Critically Endangered; NL = not listed), population trend (+ = Increasing, = = Stable, - = Decreasing, ? = Unknown) according to the IUCN Red List (The IUCN Red List of Threatened Species, Version 2016.3; www.iucnredlist.org; accessed 1 March 2017), Environmental Vulnerability Score (EVS; the higher the score the greater the vulnerability; NE = not evaluated) from Wilson et al. (2013a,b) and Johnson et al. (2015a), and conservation status in Mexico according to SEMARNAT (2010) (P = in danger of extinction, A = threatened; Pr = subject to special protection, NL – not listed). Source denotes whether the species was observed in the field by the authors (A), documented in the CONABIO data base and/or museum collections (C/M), or found in the literature (citation of source). N/A = not applicable due to being non-native.

Taxa	GD	Habitat type	IUCN	Population Trend	EVS	SEMARNAT	Source
CLASS AMPHIBIA							
ORDER CAUDATA							
Ambystomatidae (1 genus, 1 species)							
Ambystoma velasci (Dugès, 1888)	1	**CD**	**LC**	**?**	**10**	**Pr**	**A**
Plethodontidae (3 genera, 4 species)							
Bolitoglossa platydactyla (Gray, 1831)	1	**SBT**	**NT**	**–**	**15**	**Pr**	**C/M**
Chiropterotriton magnipes Rabb, 1965	1	**SMO**	**CE**	**–**	**16**	**Pr**	**C/M**
Chiropterotriton multidentatus (Taylor, 1938)	1	**SMO**	**EN**	**–**	**15**	**Pr**	**C/M**
Isthmura bellii (Gray, 1850)	1	**SMO**	**VU**	**–**	**12**	**A**	**C/M**
Salamandridae (1 genus, 1 species)							
Notophthalmus meridionalis (Cope, 1880)	2	**SBT**	**EN**	**–**	**12**	**Pr**	**C/M**
ORDER ANURA							
Bufonidae (3 genera, 6 species)							
Anaxyrus cognatus (Say, 1823)	5	**CD**	**LC**	**?**	**9**	**NL**	**A**
Anaxyrus debilis (Girard, 1854)	2	**CD**	**LC**	**=**	**7**	**Pr**	**A**
Anaxyrus punctatus Baird & Girard, 1852	2	**CD**	**LC**	**=**	**5**	**NL**	**A**
Incilius nebulifer Girard, 1854	2	**GEN**	**LC**	**=**	**6**	**NL**	**A**
Incilius occidentalis Camerano, 1879	1	**CD**	**LC**	**=**	**11**	**NL**	**A**
Rhinella horribilis (Linnaeus, 1758)	4	**GEN**	**NL**	**?**	**NE**	**NL**	**A**
Craugastoridae (1 genus, 3 species)							
Craugastor augusti (Dugès, 1879)	2	**SMO**	**LC**	**=**	**8**	**NL**	**A**
Craugastor berkenbuschii (Peters, 1870)	1	**CD**	**NT**	**–**	**14**	**Pr**	**C/M**
Craugastor decoratus (Taylor, 1942)	1	**SMO**	**VU**	**?**	**15**	**Pr**	**C/M**
Eleutherodactylidae (1 genus, 5 species)							
Eleutherodactylus cystignathoides (Cope, 1878)	2	**GEN**	**LC**	**–**	**12**	**NL**	**A**
Eleutherodactylus guttilatus (Cope, 1870)	2	**GEN**	**LC**	**?**	**11**	**NL**	**C/M**
Eleutherodactylus leprus (Cope, 1879)	3	**SMO**	**VU**	**–**	**12**	**NL**	**C/M**
Eleutherodactylus longipes (Baird, 1869)	1	**SBT**	**VU**	**?**	**15**	**NL**	**C/M**
Eleutherodactylus verrucipes Cope, 1865	1	**GEN**	**VU**	**–**	**16**	**Pr**	**C/M**
Hylidae (7 genera, 9 species)							
Hyla arenicolor Cope, 1886	2	**GEN**	**LC**	**=**	**7**	**NL**	**A**

Taxa	GD	Habitat type	IUCN	Population Trend	EVS	SEMARNAT	Source
Hyla eximia Baird, 1854	1	GEN	LC	=	10	NL	A
Hyla plicata Brocchi, 1877	1	SMO	LC	=	11	A	C/M
Rheohyla miotympanum (Cope, 1863)	1	SBT	NT	–	9	NL	A
Sarcohyla arborescandens (Taylor, 1939)	1	SBT	EN	–	11	Pr	C/M
Scinax staufferi (Cope, 1865)	3	GEN	LC	=	4	NL	A
Smilisca baudinii (Duméril & Bibron, 1841)	4	SBT	LC	=	3	NL	A
Tlalocohyla picta (Günther, 1901)	3	SBT	LC	+	8	NL	A
Trachycephalus typhonius (Linnaeus, 1758)	3	SBT	LC	=	4	NL	A
Leptodactylidae (1 genus, 2 species)							
Leptodactylus fragilis (Brocchi, 1877)	4	SBT	LC	=	5	NL	A
Leptodactylus melanonotus (Hallowell, 1861)	3	SBT	LC	=	6	NL	A
Microhylidae (2 genera, 2 species)							
Gastrophryne olivacea (Hallowell, 1857)	2	SBT	LC	=	9	Pr	C/M
Hypopachus variolosus (Cope, 1866)	4	GEN	LC	=	4	NL	A
Ranidae (1 genus, 5 species)							
Rana berlandieri Baird, 1859	4	GEN	LC	=	7	Pr	A
Rana catesbeiana Shaw, 1802	0	N/A	N/A	N/A	N/A	N/A	C/M
Rana johni Blair, 1965	1	SBT	EN	–	14	Pr	C/M
Rana montezumae Baird, 1854	1	GEN	LC	–	13	Pr	A
Rana neovolcanica Hillis & Frost, 1985	1	CD	NT	–	13	A	A
Rhinophrynidae (1 genus, 1 species)							
Rhinophrynus dorsalis Duméril & Bibron, 1841	4	SBT	LC	=	8	Pr	A
Scaphiopodidae (2 genera, 2 species)							
Scaphiopus couchii Baird, 1854	2	GEN	LC	=	3	NL	A
Spea multiplicata (Cope, 1863)	2	GEN	LC	=	6	NL	A
CLASS REPTILIA							
ORDER CROCODYLIA							
Crocodylidae (1 genus, 1 species)							
Crocodylus moreletii Duméril & Bibron, 1851	3	SBT	LC	=	13	Pr	C/M
ORDER TESTUDINES							
Emydidae (2 genera, 2 species)							
Terrapene mexicana (Gray, 1849)	1	SBT	NL	?	19	NL	C/M
Trachemys venusta (Gray, 1855)	3	GEN	NL	?	13	NL	C/M
Kinosternidae (1 genus, 4 species)							
Kinosternon herrerai Stejneger, 1925	1	GEN	NT	–	14	Pr	A
Kinosternon hirtipes (Wagler, 1830)	2	GEN	LC	–	10	Pr	A
Kinosternon integrum LeConte, 1854	1	GEN	LC	=	11	Pr	A
Kinosternon scorpioides (Linnaeus, 1766)	3	SBT	NL	?	10	Pr	A
Trionychidae (1 genus, 1 species)							
Apalone spinifera (Lesueur, 1827)	5	SBT	LC	–	15	Pr	C/M
ORDER SQUAMATA							
SUBORDER LACERTILIA							
Anguidae (4 genera, 5 species)							
Abronia taeniata (Wiegmann, 1828)	1	GEN	VU	–	15	Pr	A
Barisia ciliaris (Smith, 1942)	1	GEN	NL	?	15	NL	A

Taxa	GD	Habitat type	IUCN	Population Trend	EVS	SEMARNAT	Source
Gerrhonotus infernalis Baird, 1859	2	GEN	LC	=	13	NL	A
Gerrhonotus ophiurus Cope, 1866	1	GEN	LC	?	12	NL	A
Ophiosaurus incomptus (McConkey, 1955)	1	SBT	DD	?	15	Pr	C/M
Corytophanidae (2 genera, 2 species)							
Corytophanes hernandesii (Wiegmann, 1831)	3	SBT	LC	=	13	Pr	A
Laemanctus serratus Cope, 1864	3	SBT	LC	=	8	Pr	A
Crotaphytidae (1 genus, 1 species)							
Crotaphytus collaris (Say, 1823)	2	CD	LC	=	13	A	A
Dactyloidae (1 genus, 2 species)							
Anolis petersii Bocourt, 1873	3	SBT	NL	?	9	NL	C/M
Anolis sericeus Hallowell, 1856	3	SBT	NL	?	8	NL	A
Dibamidae (1 genus, 1 species)							
Anelytropsis papillosus Cope, 1885	1	GEN	LC	–	10	A	C/M
Eublepharidae (1 genus, 1 species)							
Coleonyx elegans Gray, 1845	3	SBT	LC	=	9	A	C/M
Gekkonidae (2 genera, 3 species)							
Gehyra mutilata (Wiegmann, 1834)	0	N/A	N/A	N/A	N/A	N/A	C/M
Hemidactylus frenatus Schlegel, 1836	0	N/A	N/A	N/A	N/A	N/A	A
Hemidactylus turcicus (Linnaeus, 1758)	0	N/A	N/A	N/A	N/A	N/A	A
Iguanidae (1 genus, 1 species)							
Ctenosaura acanthura (Shaw, 1802)	1	SBT	NL	?	12	Pr	A
Phrynosomatidae (4 genera, 19 species)							
Cophosaurus texanus Troschel, 1852	2	CD	LC	=	14	A	A
Holbrookia approximans Baird, 1859	1	CD	NL	?	14	NL	A
Phrynosoma cornutum (Harlan, 1824)	2	CD	LC	=	11	NL	A
Phrynosoma modestum Girard, 1852	2	CD	LC	=	12	NL	A
Phrynosoma orbiculare (Linnaeus, 1758)	1	GEN	LC	=	12	A	A
Sceloporus cautus Smith, 1938	1	GEN	LC	–	15	NL	A
Sceloporus cowlesi Lowe & Norris, 1956	2	CD	NL	?	13	NL	A
Sceloporus dugesii Bocourt, 1873	1	CD	LC	=	13	NL	A
Sceloporus goldmani Smith, 1937	1	CD	EN	–	15	NL	C/M
Sceloporus grammicus Wiegmann, 1828	2	GEN	LC	=	9	Pr	A
Sceloporus minor Cope, 1885	1	CD	LC	=	14	NL	A
Sceloporus olivaceus Smith, 1934	2	CD	LC	=	13	NL	A
Sceloporus parvus Smith, 1934	1	GEN	LC	=	15	NL	A
Sceloporus poinsettii Baird & Girard, 1852	2	CD	LC	=	12	NL	A
Sceloporus scalaris Wiegmann, 1828	1	CD	LC	=	12	NL	A
Sceloporus serrifer Cope, 1866	4	GEN	LC	=	6	NL	A
Sceloporus spinosus Wiegmann, 1828	1	CD	LC	=	12	NL	A
Sceloporus torquatus Wiegmann, 1828	1	GEN	LC	=	11	NL	A
Sceloporus variabilis Wiegmann, 1828		GEN	LC	=	5	NL	A
Scincidae (2 genera, 5 species)							
Plestiodon dicei (Ruthven & Gaige, 1933)	1	SMO	NL	?	7	NL	A
Plestiodon lynxe (Wiegmann, 1834)	1	GEN	LC	=	10	Pr	A
Plestiodon obsoletus Baird & Girard, 1852	2	CD	LC	=	11	NL	C/M
Plestiodon tetragrammus Baird, 1859	2	GEN	LC	=	12	NL	A
Scincella caudaequinae (Smith, 1951)	1	GEN	NL	?	NE	NL	A

Taxa	GD	Habitat type	IUCN	Population Trend	EVS	SEMARNAT	Source
Teiidae (2 genera, 3 species)							
Aspidoscelis gularis (Baird & Girard, 1852)	2	**CD**	**LC**	=	**9**	**NL**	**A**
Aspidoscelis inornatus (Baird, 1859)	2	**CD**	**LC**	–	**14**	**NL**	**A**
Holcosus amphigrammus (Smith & Laufe, 1945)	1	**GEN**	**NL**	?	**12**	**NL**	**A**
Xantusiidae (1 genus, 4 species)							
Lepidophyma gaigeae Mosauer, 1936	1	**GEN**	**VU**	–	**13**	**Pr**	**A**
Lepidophyma micropholis Walker, 1955	1	**SBT**	**VU**	?	**15**	**A**	**C/M**
Lepidophyma occulor Smith, 1942	1	**SBT**	**LC**	=	**14**	**Pr**	**A**
Lepidophyma sylvaticum Taylor, 1939	1	**SMO**	**LC**	–	**11**	**Pr**	**A**
Xenosauridae (1 genus, 1 species)							
Xenosaurus newmanorum Taylor, 1949	1	**SBT**	**EN**	–	**15**	**Pr**	**A**
ORDER SQUAMATA							
SUBORDER SERPENTES							
Boidae (1 genus, 1 species)							
Boa imperator Daudin, 1803	3	**SBT**	**NL**	?	**NE**	**NL**	**A**
Colubridae (22 genera, 36 species)							
Arizona elegans Kennicott, 1859	2	**CD**	**LC**	=	**5**	**NL**	**A**
Coluber constrictor Linnaeus, 1758	5	**SBT**	**LC**	=	**10**	**A**	**C/M**
Conopsis lineata (Kennicott, 1859)	1	**SMO**	**LC**	=	**13**	**NL**	**A**
Conopsis nasus Günther, 1858	1	**SMO**	**LC**	=	**11**	**NL**	**A**
Drymarchon melanurus (Duméril, Bibron, & Duméril, 1854)	4	**GEN**	**LC**	=	**6**	**NL**	**A**
Drymobius chloroticus (Cope, 1886)	3	**SBT**	**LC**	?	**8**	**NL**	**C/M**
Drymobius margaritiferus (Schlegel, 1837)	4	**GEN**	**NL**	?	**6**	**NL**	**A**
Ficimia hardyi Mendoza-Quijano & Smith, 1993	1	**CD**	**EN**	–	**13**	**NL**	**C/M**
Ficimia olivacea Gray, 1849	1	**SBT**	**NL**	?	**9**	**NL**	**C/M**
Ficimia streckeri Taylor, 1931	2	**GEN**	**LC**	=	**12**	**NL**	**C/M**
Gyalopion canum (Cope, 1861)	2	**CD**	**LC**	=	**9**	**NL**	**C/M**
Lampropeltis annulata Kennicott, 1861	2	**CD**	**NL**	?	**NE**	**NL**	**C/M**
Lampropeltis mexicana (Garman, 1884)	1	**CD**	**LC**	=	**15**	**A**	**A**
Lampropeltis polyzona Cope, 1860	1	**GEN**	**NL**	?	**11**	**NL**	**A**
Lampropeltis splendida (Baird & Girard, 1853)	2	**CD**	**NL**	?	**NE**	**NL**	**C/M**
Leptophis mexicanus Duméril & Bibron, 1854	3	**GEN**	**LC**	=	**6**	**A**	**A**
Masticophis flagellum (Shaw, 1802)	2	**CD**	**LC**	=	**8**	**A**	**A**
Masticophis mentovarius (Duméril, Bibron, & Duméril, 1854)	3	**GEN**	**LC**	?	**6**	**A**	**C/M**
Masticophis schotti Baird & Girard, 1853	2	**CD**	**LC**	=	**13**	**NL**	**A**
Mastigodryas melanolomus (Cope, 1868)	3	**SBT**	**LC**	=	**6**	**NL**	**C/M**
Oxybelis aeneus (Wagler, 1824)	4	**SBT**	**NL**	?	**5**	**NL**	**C/M**
Pantherophis emoryi (Baird & Girard, 1853)	2	**CD**	**LC**	=	**13**	**NL**	**A**
Phrynonax poecilonotus (Günther, 1858)	3	**SBT**	**NL**	?	**NE**	**NL**	**CM**
Pituophis catenifer Blainville, 1835	5	**GEN**	**LC**	=	**9**	**NL**	**A**
Pituophis deppei (Duméril, 1853)	1	**CD**	**LC**	=	**14**	**A**	**A**
Pseudoelaphe flavirufa (Cope, 1867)	3	**SBT**	**NL**	?	**10**	**NL**	**C/M**
Rhinocheilus lecontei Baird & Girard, 1853	2	**CD**	**LC**	=	**8**	**NL**	**A**

Taxa	GD	Habitat type	IUCN	Population Trend	EVS	SEMARNAT	Source
Salvadora grahamiae Baird & Girard, 1853	2	CD	LC	=	10	NL	A
Senticolis triaspis (Cope, 1866)	4	GEN	LC	=	6	NL	A
Spilotes pullatus (Linnaeus, 1758)	3	SBT	NL	?	6	NL	A
Tantilla atriceps (Günther, 1895)	2	CD	LC	=	11	A	C/M
Tantilla bocourti (Günther, 1895)	1	CD	LC	?	9	NL	C/M
Tantilla rubra Cope, 1876	3	SBT	LC	?	5	Pr	C/M
Tantilla shawi Taylor, 1949	1	SBT	EN	?	15	Pr	C/M
Tantilla wilcoxi Stejneger, 1902	2	CD	LC	=	10	NL	C/M
Trimorphodon tau Cope, 1870	1	CD	LC	?	13	NL	C/M
Dipsadidae (14 genera, 22 species)							
Adelphicos quadrivirgatum (Jan, 1862)	3	SBT	LC	?	10	Pr	C/M
Amastridium sapperi (Werner, 1903)		SBT	LC	=	10	NL	Calzada-Arciniega (2014)
Chersodromus rubriventris (Taylor, 1949)	1	SBT	EN	–	14	Pr	C/M
Coniophanes fissidens (Günther, 1858)	3	SBT	NL	?	7	NL	C/M
Coniophanes imperialis (Baird, 1859)	4	SBT	LC	=	8	NL	C/M
Coniophanes piceivittis Cope, 1869	3	SBT	LC	=	7	NL	C/M
Diadophis punctatus (Linnaeus, 1766)	5	CD	LC	=	4	NL	A
Geophis latifrontalis Garman, 1883	1	CD	DD	?	14	Pr	C/M
Geophis mutitorques (Cope, 1885)	1	SBT	LC	=	13	Pr	C/M
Heterodon kennerlyi Kennicott, 1860	2	CD	NL	?	11	NL	C/M
Hypsiglena jani (Dugès, 1865)	2	CD	NL	?	6	NL	A
Hypsiglena tanzeri Dixon & Lieb, 1972	1	CD	DD	?	15	NL	C/M
Imantodes cenchoa (Linnaeus, 1758)	3	SBT	NL	?	6	Pr	A
Leptodeira maculata (Linnaeus, 1758)	1	GEN	LC	=	7	Pr	A
Leptodeira septentrionalis (Kennicott, 1859)	3	GEN	NL	?	8	NL	C/M
Ninia diademata Baird & Girard, 1853	3	SBT	LC	=	9	NL	A
Pliocercus elapoides Cope, 1860	3	SBT	LC	=	10	NL	A
Rhadinaea decorata (Günther, 1858)	3	SBT	NL	?	9	NL	A
Rhadinaea gaigeae Bailey, 1937	1	GEN	DD	?	12	NL	A
Rhadinaea marcellae Taylor, 1949	1	SBT	EN	–	12	Pr	C/M
Tropidodipsas fasciata Günther, 1858	3	SBT	NL	?	13	NL	C/M
Tropidodipsas sartorii Cope, 1863	3	GEN	LC	=	9	Pr	A
Elapidae (1 genus, 1 species)							
Micrurus tener Baird & Girard, 1853	2	GEN	LC	=	11	NL	A
Leptotyphlopidae (1 genus, 3 species)							
Rena dulcis Baird & Girard, 1853	2	GEN	LC	?	13	NL	C/M
Rena myopica (Garman, 1884)	1	GEN	LC	=	13	NL	C/M
Rena segrega (Klauber, 1939)	2	CD	NL	?	NE	NL	C/M
Natricidae (3 genera, 12 species)							
Nerodia rhombifer (Hallowell, 1852)	2	GEN	LC	=	10	NL	C/M
Storeria dekayi (Holbrook, 1939)	5	SMO	LC	=	7	NL	A
Storeria hidalgoensis Taylor, 1942	1	SMO	VU	–	13	NL	A
Storeria storerioides (Cope, 1866)	1	SMO	LC	=	11	NL	A
Thamnophis cyrtopsis (Kennicott, 1860)	4	GEN	LC	=	7	A	A
Thamnophis eques (Reuss, 1834)	2	GEN	LC	=	8	A	A
Thamnophis marcianus (Baird & Girard, 1853)	4	GEN	LC	?	10	A	A

Taxa	GD	Habitat type	IUCN	Population Trend	EVS	SEMARNAT	Source
Thamnophis melanogaster (Wiegmann, 1830)	1	CD	EN	–	15	A	A
Thamnophis proximus (Say, 1823)	4	SBT	LC	=	7	A	C/M
Thamnophis scalaris Cope, 1861	1	SMO	LC	=	14	A	C/M
Thamnophis scaliger (Jan, 1863)	1	SMO	VU	–	15	A	C/M
Thamnophis sumichrasti (Cope, 1866)	1	SMO	LC	?	15	A	A
Viperidae (4 genera, 10 species)							
Agkistrodon taylori Burger & Robertson, 1951	1	SMO	LC	?	17	A	Lemos-Espinal and Dixon (2013)
Atropoides nummifer (Rüppell, 1845)	1	SBT	LC	=	13	A	Lemos-Espinal and Dixon (2013)
Bothrops asper (Garman, 1883)	3	SBT	NL	?	12	NL	Lemos-Espinal and Dixon (2013)
Crotalus aquilus Klauber, 1952	1	GEN	LC	–	16	Pr	A
Crotalus atrox Baird & Girard, 1853	2	CD	LC	=	9	Pr	A
Crotalus lepidus (Kennicott, 1861)	2	CD	LC	=	12	Pr	A
Crotalus molossus Baird & Girard, 1853	2	CD	LC	=	8	Pr	A
Crotalus pricei Van Denburgh, 1895	2	SMO	LC	=	14	Pr	Lemos-Espinal and Dixon (2013)
Crotalus scutulatus (Kennicott, 1861)	2	CD	LC	=	11	Pr	A
Crotalus totonacus Gloyd & Kauffeld, 1940	1	SBT	NL	?	17	NL	A

co, municipality of Xilitla, SLP), seems to be a misidentified *E. longipes*. *Amastridium sapperi* was added based on Calzada-Arciniega (2014). *Sceloporus cowlesi* was substituted for *S. consobrinus* based on Leaché (pers. comm.), *Scincella silvicola* for *S. caudaequinae* based on Linkem et al. (2011) and Uetz and Hošek (2017), and *Holcosus undulatus* for *H. amphigrammus* based on Meza-Lázaro and Nieto-Montes de Oca (2015). *Lampropeltis triangulum* was substituted for *L. annulata* and *L. polyzona* based on Ruane et al. (2014) and Uetz and Hošek (2017). *Xenosaurus newmanorum* was regarded as endemic to Mexico but not to San Luis Potosí based on Nieto Montes de Oca et al. (2017). No species is endemic to the state, and four are introduced: the American Bullfrog (*Rana catesbeiana*), the Common Four-clawed Gecko (*Gehyra mutilata*), the Common House Gecko (*Hemidactylus frenatus*), and the Mediterranean House Gecko (*H. turcicus*).

A list of 17 species (nine amphibians, eight reptiles) potentially occurring in San Luis Potosí was compiled (Table 2), based on species for which undocumented observations in San Luis Potosí exist but for which museum or other records are not avail-

able, and on species that have not been recorded or observed in the state, but whose distributional ranges come close to the borders of San Luis Potosí.

The species accumulation curves for all species, amphibians, and reptiles suggest that the current list of species is close to being the likely species richness for San Luis Potosí (Figure 4). These curves show a dramatic increase in documents herpetofaunal species during the 1940's and 1950's, primarily associated with the work of Edward Taylor and Hobart Smith (Smith 1939, Smith and Taylor 1945, 1950; Taylor 1949, 1950, 1952, 1953). Taken together with the relatively limited number of potential additions to the herpetofauna of San Luis Potosí (see Table 2), it seems likely that, barring the discovery of multiple cryptic species, that this is a fairly complete list of the herpetofauna of San Luis Potosí.

General distribution

Seventeen of the 41 species of Amphibians that inhabit San Luis Potosí are endemic to Mexico, two of which are restricted to small areas in the Sierra Madre Oriental around southeastern San Luis Potosí (Table 1). Eight more are distributed mainly in eastern Mexico (Table 1). The remaining seven endemic amphibians are widely distributed in central, eastern, and even western Mexico (Table 1). Of the 24 amphibian species not endemic to Mexico that inhabit San Luis Potosí, one is an introduced species, eleven more are found in the United States and Mexico, the remaining 12 species have a wide distribution from Canada to Central America, from the United States to Central or South America, or from Mexico to Central or South America (Table 1).

Morelet's Crocodile (*Crocodylus moreletii*), is widely distributed from Tamaulipas to Central America. Three of the seven species of turtles that inhabit San Luis Potosí are endemic to Mexico, two of them to eastern Mexico and another is widely distributed in western and central Mexico (Table 1). The four non-endemic species of turtles are found from southern Canada to the Balsas River of Guerrero, from the United States to Mexico, or from Mexico to South America (Table 1). Twenty-five of the 48 species of lizards that occur in the state are endemic to Mexico, two more have a narrow distribution in northern San Luis Potosí and southern Tamaulipas (*Ophisaurus incomptus* and *Lepidophyma micropholis*) one is found from southern Tamaulipas to northern Hidalgo (*Xenosaurus newmanorum*), another to a small area in Coahuila, Nuevo León, and San Luis Potosí (*Sceloporus goldmani*), one more to northern Querétaro and adjacent San Luis Potosí (*Lepidophyma occulor*), and another to a small area in San Luis Potosí, Querétaro, and Hidalgo (*Lepidophyma gaigeae*). Most of the remaining 19 lizards endemic to Mexico are distributed mainly in eastern or central Mexico, in northern Mexico (*Holbrookia approximans*), or in western and eastern Mexico (Table 1). The remaining 23 species of lizards that inhabit San Luis Potosí are not endemic to Mexico; 13 of the non-endemic are species found in the United States and Mexico; two are found from southern United States to Central America; five are distributed from Mexico to Central America; and three are introduced to San Luis Potosí (Table 1). Twenty-eight

Table 2. List of amphibian and reptile species that potentially occur in San Luis Potosí.

CLASS AMPHIBIA	
ORDER CAUDATA	
Plethodontidae	
Aquiloeurycea cephalica (Cope, 1869)	Likely to occur in south-southeastern SLP (credible but not documented or published records exist)
Bolitoglossa rufescens (Cope, 1869)	Reported by Taylor (1949) without museum record
ORDER ANURA	
Bufonidae	
Incilius marmoreus (Wiegmann, 1833)	Likely to occur in southeastern SLP
Incilius valliceps (Wiegmann, 1833)	Likely to occur in southeastern SLP
Craugastoridae	
Craugastor rhodopis (Cope, 1867)	Reported by Taylor (1949) without museum record
Eleutherodactylidae	
Eleutherodactylus dennisi (Lynch, 1970)	Likely to occur in southeastern SLP
Eleutherodactylus nitidus (Peters, 1870)	Likely to occur in southeastern SLP
Hylidae	
Sarcohyla bistincta (Cope, 1877)	Likely to occur in southeastern SLP
Ranidae	
Rana spectabilis Hillis & Frost, 1985	Likely to occur in southeastern SLP
CLASS REPTILIA	
ORDER TESTUDINES	
Testudinidae	
Gopherus berlandieri (Agassiz, 1857)	Reported by Taylor (1949) without museum record
ORDER SQUAMATA	
SUBORDER LACERTILIA	
Anguidae	
Gerrhonotus farri Bryson & Graham, 2010	Likely to occur in central-eastern SLP
Phrynosomatidae	
Sceloporus aeneus Wiegmann, 1828	Likely to occur in southeastern SLP
Scincidae	
Scincella gemmingeri (Cope, 1864)	Likely to occur in southeastern SLP
Teiidae	
Aspidoscelis neomexicanus (Lowe & Zweifel, 1952)	Reported by Taylor (1949) without museum record
ORDER SQUAMATA	
SUBORDER SERPENTES	
Colubridae	
Lampropeltis ruthveni Blanchard, 1920	Likely to occur in southern SLP
Dipsadidae	
Rhadinaea montana Smith, 1944	Likely to occur in central-eastern SLP
Leptotyphlopidae	
Epictia goudotti (Duméril & Bibron, 1844)	Likely to occur in southeastern SLP

of the 85 species of snakes are endemic to Mexico (Table 1). Twenty-three snake species that are found in San Luis Potosí are distributed from the United States to Mexico; another 22 species range from Mexico to Central or even South America; eight more species are found from central or southern United States to Central or South America; and four more range from Canada to Mexico or even Central America (Table 1).

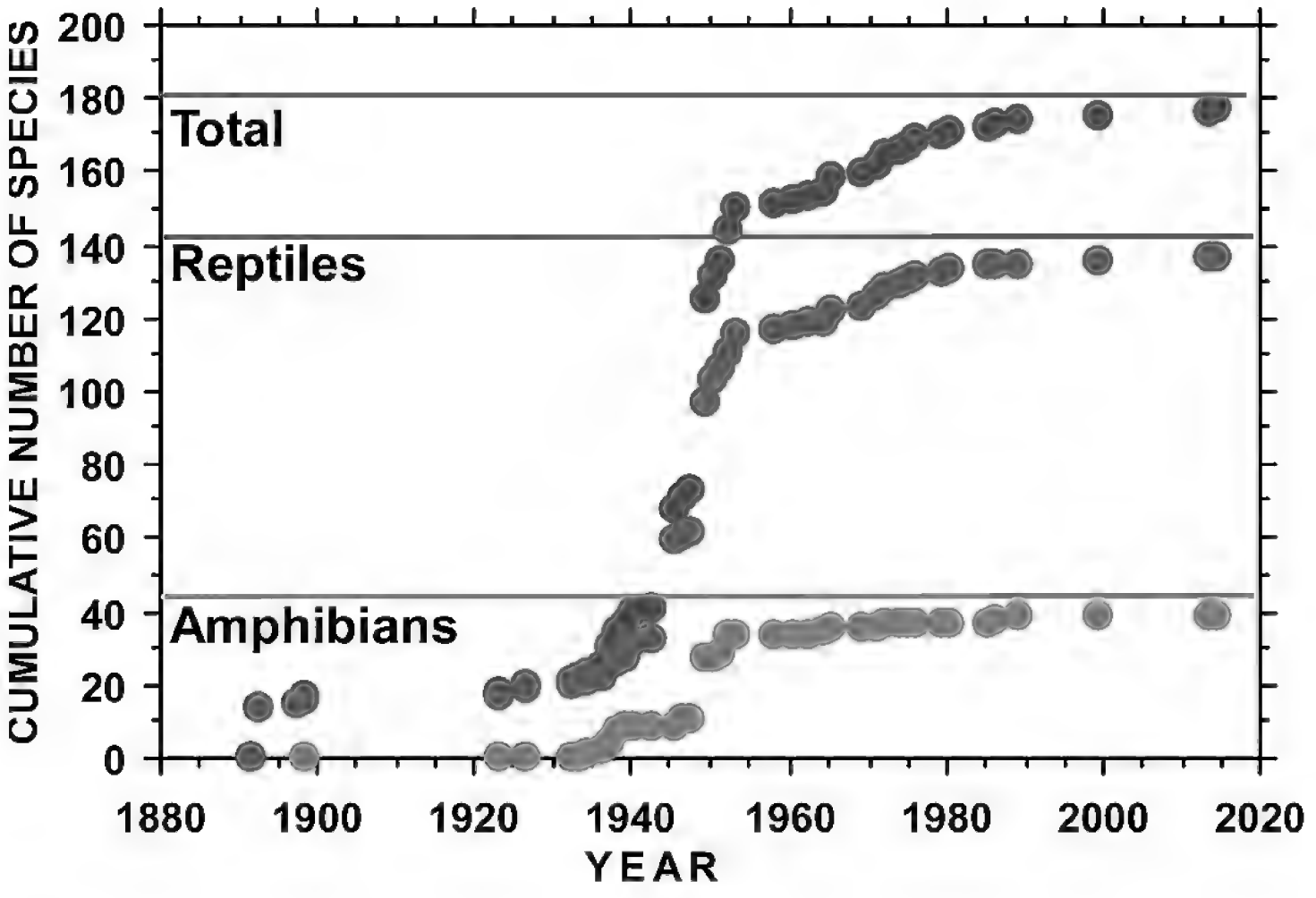

Figure 4. Species accumulation curves for the total herpetofauna, amphibians, and reptiles from San Luis Potosí. Horizontal lines are estimated asymptotes for the species accumulation curves.

Habitat types

When considering all the species of amphibians and reptiles in San Luis Potosí, the number of species in the Chihuahuan Desert, the subtropics of the Sierra Madre Oriental, and generalist habitat types are about equal with 30% of the species occurring in each of these habitat types (Table 3) The temperate forests of the Sierra Madre Oriental has much fewer species (Table 3); however, this overall pattern is primarily a function of the distribution of reptile species, since all reptile groups tend to follow this pattern, with the number of reptile species found only in the temperate forests of the Sierra Madre Oriental being particularly low compared to the other habitat types (Table 3). For amphibians, the pattern is more complicated. Anurans have a higher number of species using the subtropics of the Sierra Madre Oriental and are generalists more than either the Chihuahuan Desert and the temperate forests of the Sierra Madre Oriental (Table 3). On the other hand, 50% of salamander species are found in the temperate forests of the Sierra Madre Oriental (Table 3). These patterns of distribution for amphibians likely parallel their need for moist habitats.

At the family level, some families appear to be primarily associated with specific habitat types whereas others are found across habitat types. Bufonidae, Phrynosomatidae, and Teiidae are primarily associated with the Chihuahuan Desert; Plethodontidae is primarily found in the Sierra Madre Oriental; Hylidae is primarily found in the subtropics of the Sierra Madre Oriental; Colubridae and Dipsadidae are often found

Table 3. Summary of the number of native species (% in parentheses) in different taxonomic groups found in different habitat types in San Luis Potosí, Mexico (see Table 2 for abbreviations).

Taxa	CD	SMO	SBT	GEN
Amphibia	7 (17.5)	7 (17.5)	13 (32.5)	13 (32.5)
Caudata	1 (16.7)	3 (50)	2 (33.3)	0 (0)
Anura	6 (17.6)	4 (11.8)	11 (32.4)	13 (32.5)
Reptilia	48 (34.8)	12 (8.7)	37 (26.8)	41 (29.7)
Crocodylia	0 (0)	0 (0)	1 (100)	0 (0)
Testudines	0 (0)	0 (0)	3 (42.8)	4 (57.1)
Squamata	48 (36.9)	12 (9.2)	33 (25.4)	37 (28.5)
Lacertilia	16 (35.6)	2 (4.4)	10 (22.2)	17 (37.8)
Serpentes	32 (37.6)	10 (11.8)	23 (27.0)	20 (23.5)
Total	55 (30.9)	19 (10.7)	50 (28.1)	54 (30.3)

in the Chihuahuan Desert and the subtropics of the Sierra Madre Oriental, but few of their species are found in the Sierra Madre Oriental; and Viperidae are found in all three habitat types.

Comparisons with neighboring states

Overall, San Luis Potosí shares the most species with Hidalgo and Tamaulipas, and shares the least number of species with Nuevo León (Table 4). It is particularly interesting to note that for most taxa Hidalgo shares the highest proportion of species with San Luis Potosí whereas Tamaulipas shares the highest proportion of lizard species by a large margin and Nuevo León shares a very high proportion (≈ 90%) of phrynosomatid species (Table 4). It is likely that this reflects the more arid nature of Tamaulipas and Nuevo León (i.e., Chihuahuan Desert), compared to the more mountainous Querétaro and Hidalgo. Thus, the numbers and types of shared species among San Luis Potosí and its neighboring states reflects the pattern of habitat and vegetation types found in each neighboring state (see also Smith and Lemos-Espinal 2015, Lemos-Espinal and Smith 2016, Lemos-Espinal et al. 2017). However, the results of the cluster analysis are somewhat different. The cluster analysis found that San Luis Potosí is clustered with the pair of Hidalgo and Querétaro for all species together and reptiles (Figure 5A). In contrast, for amphibians San Luis Potosí clusters with Querétaro, and this pair clusters with the pair of Nuevo León and Hidalgo (Figure 5B). Thus, it appears that amphibians and reptiles show different affinities among these states, again perhaps reflecting the available habitats or environments in each state. It therefore appears that in addition to state-specific conservation and management plans, more integrated habitat specific conservation plans that allow inter-state efforts would be the best approach to preserve the herpetofauna of San Luis Potosí and its neighboring states. In addition, the results of the cluster analysis suggest that amphibians and reptiles will each require different inter-state collaborations (i.e., the states involved in such collaborations might differ between amphibians and reptiles based on the different patterns of clustering between these taxa).

Table 4. Summary of the numbers of species shared between San Luis Potosí and neighboring Mexican states (not including introduced species). The percent of species from San Luis Potosí shared by a neighboring state are given in parentheses. – indicates either San Luis Potosí or the neighboring state has no species in the taxonomic group, thus no value for shared species is provided.

Taxa	San Luis Potosí	Hidalgo	Querétaro	Nuevo León	Tamaulipas
Class Amphibia	40	35 (87.5)	26 (65)	17 (42.5)	29 (72.5)
Order Caudata	6	5 (83.3)	4 (66.7)	0 (0)	4 (66.7)
Ambystomatidae	1	1 (100)	1 (100)	0 (0)	–
Plethodontidae	4	3 (75)	3 (75)	0 (0)	3 (75)
Salamandridae	1	1 (100)	–	–	1 (100)
Order Anura	34	30 (88.2)	22 (64.7)	17 (52)	25 (73.5)
Bufonidae	6	4 (67)	4 (67)	5 (83.3)	5 (83.3)
Craugastoridae	3	3 (100)	2 (67)	1 (33)	2 (67)
Eleutherodactylidae	5	3 (60)	3 (60)	3 (60)	4 (80)
Hylidae	9	9 (100)	6 (67)	2 (22.2)	5 (55.6)
Leptodactylidae	2	2 (100)	–	1 (50)	2 (100)
Microhylidae	2	1 (50)	1 (50)	2 (100)	2 (100)
Ranidae	4	4 (100)	3 (75)	1 (25)	2 (50)
Rhinophrynidae	1	1 (100)	1 (100)	–	1 (100)
Scaphiopodidae	2	2 (100)	2 (100)	2 (100)	2 (100)
Class Reptilia	138	98 (71.0)	92 (66.7)	75 (54.3)	100 (72.5)
Order Crocodylia	1	1 (100)	0 (0)	0 (0)	1 (100)
Crocodylidae	1	1 (100)	–	–	1 (100)
Order Testudines	7	5 (71.4)	3 (42.8)	2 (28.6)	5 (71.4)
Emydidae	2	1 (50)	–	0 (0)	1 (50)
Kinosternidae	4	4 (100)	3 (75)	1 (25)	3 (75)
Trionychidae	1	–	–	1 (100)	1 (100)
Order Squamata	130	92 (70.8)	73 (56.2)	73 (56.2)	94 (72.3)
Suborder Lacertilia	45	25 (55.6)	22 (48.9)	27 (60.0)	36 (80.0)
Anguidae	5	3 (60)	1 (20)	2 (40)	5 (100)
Corytophanidae	2	1 (50)	1 (50)	–	1 (50)
Crotaphytidae	1	–	–	1 (100)	1 (100)
Dactyloidae	2	2 (100)	1 (50)	–	1 (50)
Dibamidae	1	1 (100)	1 (100)	–	1 (100)
Eublepharidae	1	–	–	–	–
Iguanidae	1	1 (100)	–	–	1 (100)
Phrynosomatidae	19	9 (47.4)	10 (52.6)	17 (89.5)	15 (78.9)
Scincidae	5	3 (60)	3 (60)	4 (80)	5 (100)
Teiidae	3	2 (66.7)	2 (66.7)	2 (66.7)	3 (100)
Xantusiidae	4	2 (50)	3 (75)	1 (25)	2 (50)
Xenosauridae	1	1 (100)	0 (0)	–	1 (100)
Suborder Serpentes	85	67 (78.8)	51 (60.0)	46 (54.1)	58 (68.2)
Boidae	1	1 (100)	1 (100)	–	1 (100)
Colubridae	36	24 (66.7)	22 (61.1)	23 (63.9)	27 (75)
Dipsadidae	22	19 (86.4)	13 (59.1)	6 (27.3)	14 (63.6)
Elapidae	1	1 (100)	1 (100)	1 (100)	1 (100)
Leptotyphlopidae	3	2 (66.7)	1 (33.3)	2 (66.7)	2 (66.7)
Natricidae	12	12 (100)	7 (58.3)	7 (58.3)	6 (50)
Viperidae	10	8 (80)	6 (60)	7 (70)	7 (70)
TOTAL	**178**	**133 (74.8)**	**118 (66.3)**	**92 (51.7)**	**129 (72.5)**

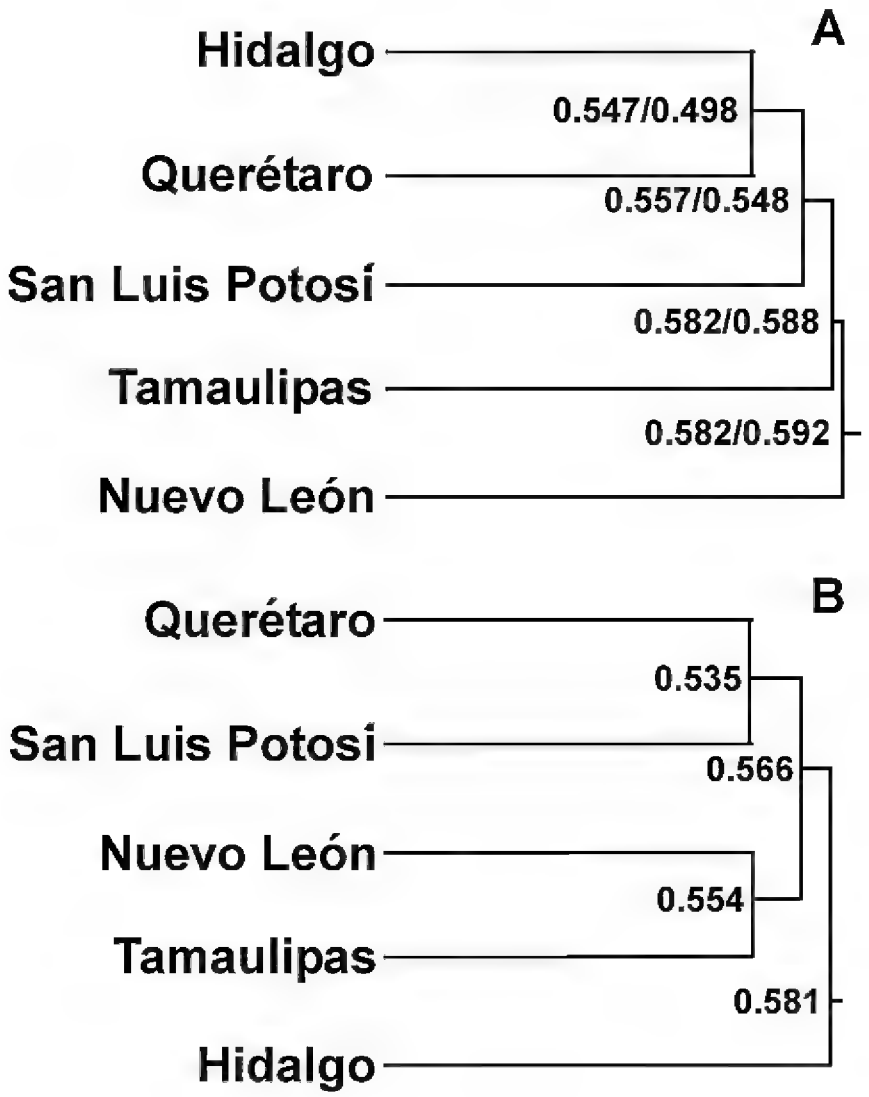

Figure 5. Results of cluster analysis of the herpetofaunas of San Luis Potosí and its neighboring states (Hidalgo, Nuevo León, Querétaro, and Tamaulipas). The distances provided are Euclidean distances for **A** the entire herpetofauna and reptiles only, respectively and **B** amphibians only.

Conservation status

Nearly 82% of the amphibians and reptile species that have been evaluated by the IUCN falls in the Least Concern category (does not include DD species; Table 5, Figure 6). However, only 60% are not listed by SEMARNAT (Table 5, Figure 6). The discrepancy between the IUCN and SEMARNAT listings are greater for reptiles than amphibians (Figure 6). The average EVS for all herpetofaunal species in San Luis Potosí that have been evaluated is 10.67. These overall numbers tend to obscure the presence of particular groups, or even individual species, that occur in San Luis Potosí that are at potential risk and that may warrant special attention. Some taxa of particular concern, based on their IUCN listing, SEMARNAT category, or their EVS include the salamanders in general, and Plethodontidae and Salamandridae in particular; the emydid and trionychid turtles, anguid and xenosaurid lizards, and natricid and colubrid snakes. These taxa reflect assessments at the global or country-level scale. It may be, and indeed it is likely, that there are multiple species of amphibians and reptiles that are more or less threatened at the state level than these larger scale assessments suggest. However, given the relative paucity of population-level studies and assessments on the herpetofauna of San Luis Potosí, such conservation or management needs are unknown.

Table 5. Summary of native species present in San Luis Potosí by family, order or suborder, and class. Status summary indicates the number of species found in each IUCN conservation status in the order DD, LC, V, NT, E, CE (see Table 1 for abbreviations; in some cases species have not been assigned a status by the IUCN and therefore these may not add up to the total number of species in a taxon). Mean EVS is the mean Environmental Vulnerability Score, scores > 14 are considered high vulnerability (Wilson et al., 2013a,b) and conservation status in Mexico according to SEMARNAT (2010) in the order NL, Pr, A, P (see Table 1 for abbreviations).

Class	Order/ Suborder	Family	Status Summary	Mean EVS	SEMARNAT
Amphibia	Caudata		0,1,1,1,1,1	13.33	0,4,1,1
		Ambystomatidae	0,1,0,0,0,0	10	0,1,0,0
		Plethodontidae	0,0,1,1,1,1	14.5	0,3,1,0
		Salamandridae	0,0,0,0,1,0	12	0,0,0,1
	Anura		0,24,4,3,2,0	8.93	22,9,2,1
		Bufonidae	0,5,0,0,0,0	7.6	5,1,0,0
		Craugastoridae	0,1,1,1,0,0	12.33	1,2,0,0
		Eleutherodactylidae	0,2,3,0,0,0	13.2	4,1,0,0
		Hylidae	0,7,0,1,1,0	7.44	7,1,1,0
		Leptodactylidae	0,2,0,0,0,0	5.5	2,0,0,0
		Microhylidae	0,2,0,0,0,0	6.5	1,1,0,0
		Ranidae	0,2,0,1,1,0	11.75	0,2,1,1
		Rhynophrynidae	0,1,0,0,0,0	8	0,1,0,0
		Scaphiopodidae	0,2,0,0,0,0	4.5	2,0,0,0
	Subtotal		0,25,5,4,3,1	9.59	22,13,3,2
Reptilia	Crocodylia		0,1,0,0,0,0	13	0,1,0,0
		Crocodylidae	0,1,0,0,0,0	13	0,1,0,0
	Testudines		0,3,0,1,0,0	13.14	2,5,0,0
		Emydidae	0,0,0,0,0,0	16	2,0,0,0
		Kinosternidae	0,2,0,1,0,0	11.25	0,4,0,0
		Trionychidae	0,1,0,0,0,0	15	0,1,0,0
	Squamata		4,84,5,0,7,0	10.82	80,26,22,1
	Lacertilia		1,29,3,0,2,0	11.84	28,10,6,1
		Anguidae	1,2,1,0,0,0	14	3,1,0,1
		Corytophanidae	0,1,0,0,0,0	10.5	0,2,0,0
		Crotaphytidae	0,1,0,0,0,0	13	0,0,1,0
		Dactyloidae	0,0,0,0,0,0	8.5	2,0,0,0
		Dibamidae	0,1,0,0,0,0	10	0,0,1,0
		Eublepharidae	0,1,0,0,0,0	9	0,0,1,0
		Iguanidae	0,0,0,0,0,0	12	0,1,0,0
		Phrynosomatidae	0,16,0,0,1,0	12	16,1,2,0
		Scincidae	0,3,0,0,0,0	10.0	4,1,0,0
		Teiidae	0,2,0,0,0,0	11.7	3,0,0,0
		Xantusiidae	0,2,2,0,0,0	13.25	0,3,1,0
		Xenosauridae	0,0,0,0,1,0	15	0,1,0,0
	Serpentes		3,55,2,0,5,0	10.29	52,16,16,0
		Boidae	0,0,0,0,0,0		1,0,0,0
		Colubridae	0,25,0,0,2,0	9.42	27,2,6,0
		Dipsadidae	3,10,0,0,2,0	9.73	14,8,0,0
		Elapidae	0,1,0,0,0,0	11	1,0,0,0
		Leptotyphlopidae	0,2,0,0,0,0	13	3,0,0,0
		Natricidae	0,9,2,0,1,0	11	4,0,8,0
		Viperidae	0,8,0,0,0,0	12,9	2,6,2,0
	Subtotal		4,88,5,1,7,0	10.95	82,32,22,1
TOTAL			4,109,10,4,10,1	10.64	105,45,25,3

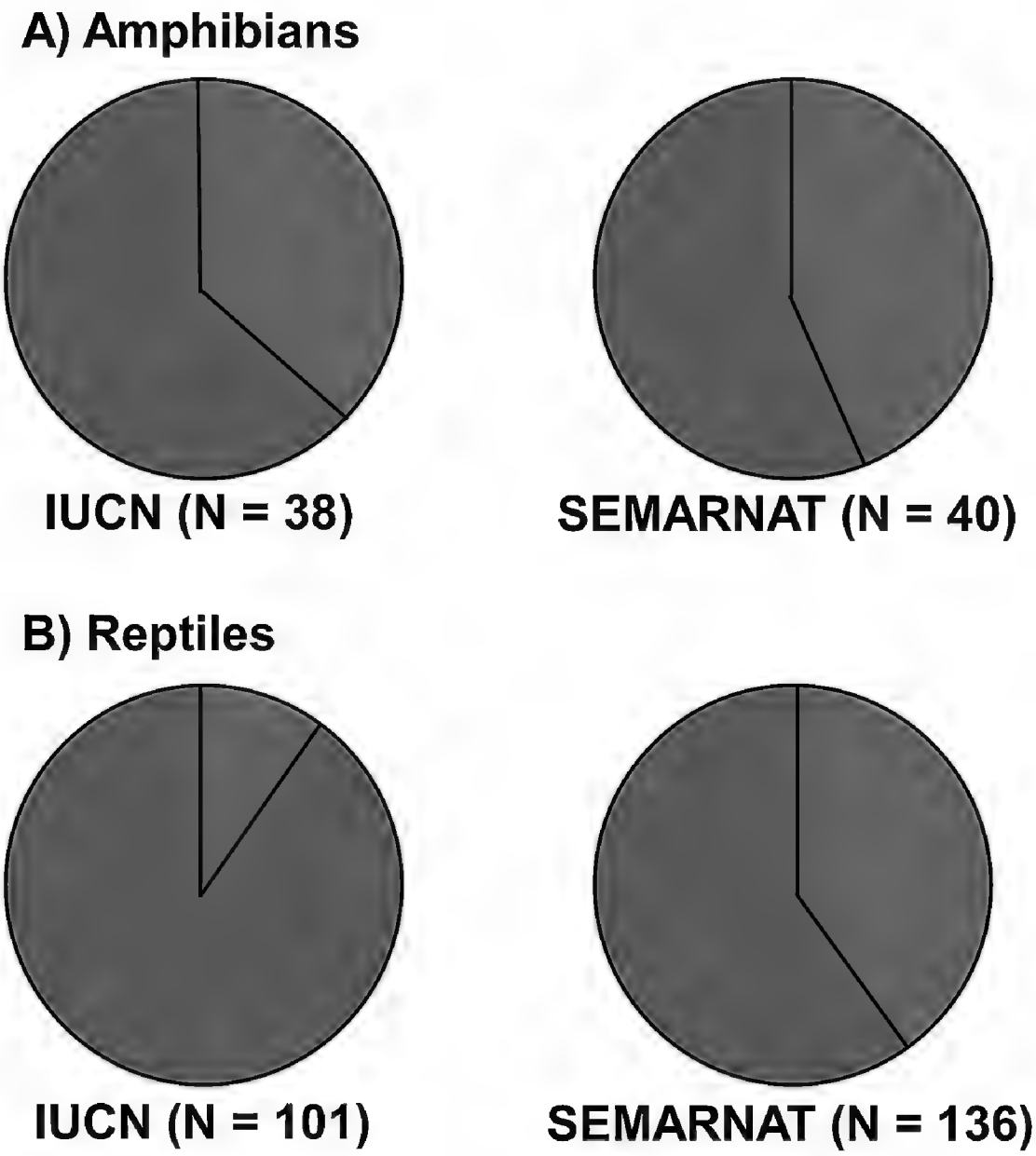

Figure 6. Percent of **A** amphibians and **B** reptiles listed in protected categories on the IUCN Red List and SEMARNAT. Green is percent in Least Concern (IUCN) or Not Listed (SEMARNAT), Red is percent in protected categories. N is the total number of species assessed by each agency.

The conservation status of the reptiles and amphibians in each habitat type was examined. For amphibians, the percentage of species in protected IUCN categories (VU, NT, EN, CE) varied among the habitat types. Twenty-nine percent of amphibians in the Chihuahuan Desert were listed in IUCN categories, 72% in the Sierra Madre Oriental, 46% in the subtropics of the Sierra Madre Oriental, and 8% of the generalists. For SEMARNAT categories, 57% of amphibians in the Chihuahuan Desert, 72% in the Sierra Madre Oriental, 46% of the subtropics of the Sierra Madre Oriental, and 23% of the generalists were listed. Thus, for amphibians, species found in the Sierra Madre Oriental are the most threatened whereas the generalists were least threatened. Reptiles showed a slightly different pattern. For the IUCN listings, all habitat types had relatively few species in the protected categories (Chihuahuan Desert, 8%; Sierra Madre Oriental, 18%; subtropics of the Sierra Madre Oriental, 10%; and generalists, 9%). However, for SEMARNAT, 28% of reptiles in the Chihuahuan Desert, 50% from the Sierra Madre Oriental, 50% from the subtropics of the Sierra Madre Oriental, and 42% of the generalist species were in the protected categories. For reptiles, the conservation status of the species in each habitat type is more evenly distributed across the habitat types than in amphibians.

Hopefully, by establishing this list of herpetofaunal species with their global and country-level conservation statuses will prompt further investigations into the amphibians and reptiles of this state, which could provide the needed information to allow for state specific, or even habitat type, conservation measures to be undertaken. Specific threats known to be present in San Luis Potosí are deforestation and habitat loss (Miranda-Aragón et al. 2012, Reyes Hernández et al. 2013, Ramos-Lara and Koprowski 2014), industrial pollutants and heavy metals (Alcalá-Jáuregui et al. 2014, Pérez-Vázquez et al. 2016a, b), mining (Razo et al. 2004, Chapa-Vargas et al. 2010, Espinosa-Reyes et al. 2014), and overexploitation of water resources (Esteller et al. 2012).

Acknowledgments

We thank J. Sigala and J. Penner for very helpful comments that greatly improved the manuscript. Support for this study was provided by Dirección General de Asuntos del Personal Académico, Programa de Apoyo a Proyectos de Investigación e Innovación Tecnológica (DGAPA-PAPIIT) through the Project IN215418. We are grateful to Alejandra Núñez Merchand from the National Commission for the Understanding and Use of Biodiversity (CONABIO) for kindly creating and providing the topographic, climate, and vegetation maps used in this publication.

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